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Where Are the Women Geoscientist Professors?

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Meetings

Where Are the Women Geoscientist Professors?

Nearly 50 geo- and social scientists recently gathered in Washington, D.C., for a workshop on women in the geosciences. The two-fold purpose was to compile data on the status of women in the geosciences, and to arrive at a consensus on strategies to increase the proportion of women and their diversity in the field.

Participants spanned 4 decades of experience, including both genders, and represented many types of academic institutions, from high school to private, bachelor's degree-granting colleges to public and private Research I institutions. Two social scientists who specialize in women-in-science issues also participated.

Sonia Esperanca from the National Science Foundation (NSF) opened the workshop with a presentation on NSF's ADVANCE program to increase gender diversity in the sciences. Geoffrey Cohen of Yale university's department of psychology presented research findings on "stereotype threat," a phenomenon whereby people fear that others will view them as a stereotype. This apprehension negatively affects performance and causes the person to behave in a manner that fulfills the stereotype. Three panel discussions addressed the data, career paths and options, and under-recruitment and under-retention of women and minorities in the field.

Workshop participants agreed that the data indicate that we lose women at every juncture in a geoscientist's career from under-recruitmentof women to major in the geosciences, through to post-tenure burnout. The greatest losses of recruited women occur between the completed bachelor's and completed Ph.D. programs, and during hiring into academic positions. Once hired, women appear to fare as well as their male counterparts in reaching tenure and their first promotion, although low numbers of women preclude statistical confidence in this assertion.

One of the biggest "leak points" for promising female academics is between the bachelor's and/or masters and the Ph.D. degree. There was strong agreement that we are not attracting young women into doctoral programs. Threereasons were cited to explain much of this loss: poor advising, loss to jobs in industry, and the fact that women see few or no role models who have combined family and academic careers. The message students take from this lack of role models is that it is not possible to have both family and an academic career. Thus, students are watching what we do, not listening to what we say.

The hiring rate for women into "assistant professor" positions listed in the American Geological Institute's (AGI) Directory of Geoscience Departments [Claudy, 2001] lags behind the 10-year running average for women receiving the Ph.D. in the geosciences, indicating that women are being under-hired into tenure-track positionsparticularly at master's and Ph.D.-granting institutions. A study at Columbia University suggests that women are not in the applicant pools for tenure-track positions (see full report: http://www.columbia.edu/cu/senate/annual_reports/0001/women.htm). Women may be under-rating their qualifications for open positions (at least in part an advising issue) and/or opting to not continue along the academic track after the Ph.D. More aggressive recruiting procedures; such as those outlined on the University of Michigan's ADVANCE/STRIDE Web site (http://www.umich.edu/~advproj/stride.html), should help.

Women continue to leak out of the academic pipeline even after achieving tenure and promotion. Although numbers are very small, women appear to lag behind their male counterparts in promotion to full professor. Focus groups and interviews with women geoscientists indicate that, particularly for the first or 'lone' woman on a geosciences faculty, isolation and "accrual of disadvantage"—being hired at lower pay to begin with, having less postdoctoral work apply toward tenure, lack of collegial partners, etc.; see Valian [1999]—leave some women geoscientists underpaid, overly committed to service work, and ready to leave, even after tenure and promotion to full professor. Of added concern are women who have accepted non-tenure track positions to follow a partner and now find themselves in increasingly marginalized and underpaid positions, facing uncertain futures after a decade or more of service to their institutions.

Panel Discussions

The first panel discussion on "The Data" included panelists Mary Anne Holmes, (University of Nebraska-Lincoln), Julie Winkler (Michigan State University), and Robin Bell (Columbia University/Lamont Doherty Earth Observatory). Holmes used data from the *National Science Board* [2002] and an electronic copy of the AGI Directory [Claudy, 1997, 2001, and 2002] to show where the major leaks in the geosciences academic pipeline occur [Holmes et al., 2003] as discussed above.

Winkler conducted surveys of geography departments and analyzed the 1997-1998 Guide to Geography Departments. She found that few women make it into the geographic sciences pipeline. Only 8% of all full professors are women. They currently under-earn their male counterparts by $18,000/yr in full professor positions. While Holmes showed that the proportion of women on academic faculty decreases with higher degrees granted, Winkler showed the opposite trend for geography departments, with a greater proportion of women in faculty positions at Ph.D.-granting institutions than at bachelor's degree-granting institutions.

Bell reported on a detailed self-study of who are less interested in competing against Columbia University's slow-pace toward gender all comers, and more interested in lending a equity [Bell et al., 2003]. They found that in the geosciences, Columbia is out-producing the national average for women Ph.D.s, but that sparse numbers of women Ph.D.s are in their applicant pool for faculty positions. The Columbia team just received an NSF ADVANCE Institutional Grant to address this issue.

The second panel addressed "Career Paths and Expectations" with presenters Carol de Wet (Franklin & Marshall College), Gail Ashley (Rutgers University), Pam Muller (University of South Florida), and Jill Karsten (AGU). De Wet summarized data showing the numbers of female scientists increasing and that the majority of women scientists are married to scientists. This generates what physicists term "the dual body problem" leading to commuter marriages, trailing spouses, or the "family squeeze" (two full-time careers + family). Working with a physician, she and Ashley demonstrated the overlap of the tenure clock with the biological clock [de Wet et al., 2001]. Muller presented the results of a successful lawsuit of female full professors against the University of Florida system. The plaintiffs uncovered written documentation that female salaries-were capped at 80% of men's salaries in comparable positions. Karsten presented AGU's efforts to increase diversity in the geosciences and described her own experiences with academia and family issues.

This panel led to a lively discussion of what factors determine an "ideal geosciences department," and the conveners will develop a list of the "100 best departments" that most closely fit the participants' vision of what constitutes a family-friendly, and hence, both female- and male-friendly academic workplace.

The last panel addressed recruitment and retention issues. Panelists were Joanne McGrath Cohoon (University of Virginia), Marilyn Suiter (NSF), Connie Frey (University of Nebraska-Lincoln), and Julie Hood (Maritime and Science Technology High School, Miami, Florida). Hood presented innovative and creative ideas she is using to recruit more students into the geosciences. Cohoon studies gender equity issues in computer sciences and physics. She finds that retention of female students for geoscience Ph.D. programs lags behind other science fields, but that completion rates for males and females are comparable, and better than in other science flelds. While recognizing that leaks occur throughout the academic career, Cohoon pointed out that modest increases in recruitment to bachelor's programs (6%, or 104 more female students per year) and rigorous attention to retention can generate gender parity by 2007. On the other hand, she pointed out that with no increases, it will be at least another 45 years before parity is reached. Workshop participants agreed that retention requires that role models and mentors be provided on the faculty.

Suiter picked up on the wide-ranging discussion of mentorship to initiate discussion of what constitutes a good mentor. Good mentors come in either gender, and are academics who are less interested in competing against all comers, andmore interested in lending a guiding hand to the next generation. Good mentors follow a hands-on approach, never assuming that students will "just get it" but that students and junior faculty at all ranks need clear-cut instructions and guidance on professional development.

Frey presented results from focus groups of geoscientists on what attracts students to our field and what keeps them there. Male participants tended to cite the subject matter and a love of outdoors and nature. Female participants also cited these factors, but there was more personal connection in their stories: professors in introductory classes rather than the class itself; family members who encouraged them; and professors who took a personal interest in them.

Students' concerns about continuing for a Ph.D. included financial concerns; poor advising (advisors who lacked mentorship skills and held a "sink or swim" attitude); and for women, climate issues. Women cited the solid wall of opposition academia puts up toward family-friendly policies: lack of daycare in graduate school, as well as for faculty, lack of flexibility in appointments, and difficulties with dual-career issues.

Strategies for Addressing the Principal Leaks

We are faced with a circular dilemma: women will not be attracted into academia as long as they do not see role models whose lives they wish to emulate, and academia will not attract this wide range of lifestyles until some fundamental changes occur.

A workshop summary will be available for distribution in 2004. In the meantime, see the Association for Women Geoscientists' Gender Equity Web site for updates, presentations given at the workshop, and links to resources for dual-career couples (http://www.awg.org/gendereq.html), including sample contracts and strategies for negotiation.

The Workshop on Women in the Geosciences was held September 25-27 in Washington, D.C.

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